

IN THE CLAIMS:

1-23 (Cancelled)

24. (Currently amended) A method of fabricating a dual spin valve (SV) sensor which comprises the steps of:

a) sputter depositing the multilayer dual SV sensor including a first spin valve (SV) stack, a second spin valve (SV) stack and a longitudinal bias stack disposed between the first and second SV stacks the first spin valve stack including a first magnetic free layer, and the second spin valve stack including a second magnetic free layer;

wherein said depositing a longitudinal bias stack further comprises:

depositing a first decoupling layer adjacent to the first magnetic free layer;

depositing a first ferromagnetic layer;

depositing a layer of antiferromagnetic material;

depositing a second ferromagnetic layer; and

depositing a second decoupling layer;

the first decoupling layer being deposited to such a thickness to

magnetostatically couple the first ferromagnetic layer and the first magnetic free layer and sufficiently thick to avoid exchange coupling the first ferromagnetic layer with the first magnetic free layer;

the second decoupling layer being deposited to such a thickness to magnetostatically couple the second ferromagnetic layer and the second magnetic free layer and sufficiently thick to avoid exchange coupling the second ferromagnetic layer with the second magnetic free layer;

- b) annealing the dual SV sensor at a first temperature in a first magnetic field oriented in a transverse direction perpendicular to an air bearing surface; and
- c) annealing the dual SV sensor at a second temperature in a second magnetic field oriented in a longitudinal direction parallel to said air bearing surface, wherein said second temperature is less than said first temperature and said second magnetic field has a magnitude smaller than said first magnetic field.

25 (Original) The method of fabricating a dual SV sensor as recited in claim 24, wherein said first temperature is about 280 C and said second temperature is about 240 C.

26. (Previously presented) The method of fabricating a dual SV sensor as recited in claim 24, wherein said first magnetic field has a magnitude of about 10,000 Oe and said second magnetic field has a magnitude of about 200 Oe.

27-35 (Cancelled)

36. (Cancelled)

37. (Currently Amended) A method as recited in claim ~~36~~ 24 wherein said first and second decoupling layers each comprise, a layer of Cu-O and a layer of Ru.

38. (Previously presented) A method as recited in claim 36 wherein said first and second ferromagnetic layers comprise Co-Fe.

39. (Previously presented) A method as recited in claim 36 wherein said layer of antiferromagnetic material comprises Ir-Mn.

40. (Previously presented) A method as recited as recited in claim 24 wherein said step of depositing a dual spin valve sensor comprises DC-magnetron sputtering.

41. (Previously presented) A method as recited in claim 37 wherein said Cu-O layers are deposited by DC-magnetron sputtering using a Cu target in a mixture of argon and oxygen gases.